

IN THE CLAIMS

Please cancel without prejudice Claims 42-48, and substitute therefor new Claims 49-55 as follows:

~~1-49~~. An atomic force microscope comprising:

a scanning mechanism;

a light source;

a cantilever moved by said scanning mechanism so that the cantilever may be scanned over a sample;

an optical assembly comprising focusing means for forming a point source of light between a fixed end and a free end of said scanning mechanism, and at least one steering lens mounted on said scanning mechanism to guide a light beam emitted from said light source onto said cantilever and to follow substantially a fixed point on said cantilever during movement of said scanning mechanism; and

a position detector which receives a reflected light beam from said cantilever and detects a deflection of said cantilever.

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*cont*  
~~2-50~~. An atomic force microscope as recited in Claim ~~1-49~~, where said reflected light beam does not pass through said steering lens.

~~3-51~~. An atomic force microscope, comprising:

a scanning mechanism;

a light source and focusing means positionally decoupled from a scanning motion of the scanning mechanism and arranged

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to emit a light beam that converges to a focus point and then diverges;

a cantilever moved by said scanning mechanism so that the cantilever may be scanned over a sample;

an optical assembly comprising at least one steering lens mounted on said scanning mechanism to guide said light beam on said cantilever and to follow substantially a fixed point on said cantilever during movement of said scanning mechanism; and

a position detector which receives a reflected light beam from said cantilever and detects a deflection of said cantilever.

*4* ~~52~~. An atomic force microscope as recited in Claim <sup>3</sup>~~51~~, wherein said focus point of said light beam is located between a fixed end and a free end of said scanning mechanism.

*5* ~~53~~. An atomic force microscope, comprising:

a scanning mechanism;

a cantilever moved by said scanning mechanism so that the cantilever may be scanned over a sample;

a light source and focusing means comprising one or more lenses that emit a beam of light onto said cantilever;

a position detector which receives said reflected light beam from said cantilever and detects a deflection of said cantilever; and

at least one additional lens, positionally decoupled from a scanning motion of the scanning mechanism, and placed in the

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path of said reflected light beam between said cantilever and said position detector.

6 54. The atomic force microscope of Claim <sup>5</sup>~~53~~, wherein said at least one additional lens is arranged at a position between said cantilever and said position detector to create at the position detector a point of convergence of beams reflected off the cantilever when the cantilever is undeflected by the sample, thereby to minimize false deflection signals resulting from the scanning motion of the cantilever relative to said position detector.

7 55. An atomic force microscope, comprising:  
a scanning mechanism comprising at least one scanning tube;  
a light source;  
a cantilever moved by said scanning mechanism so that the cantilever may be scanned over a sample;  
an optical assembly comprising at least one steering lens mounted in the interior of said at least one scanning tube to guide a light beam emitted from said light source on said cantilever and to follow substantially a fixed point on said cantilever during movement of said scanning mechanism; and  
a position detector which receives a reflected light beam from said cantilever and detects a deflection of said cantilever.

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